REMARKS

Claims 1-95 and 118-144 are currently pending in the application. Claims 96-117 have been canceled without prejudice to pursue them in divisional applications. No new matter has been added.

Claim Rejections under 35 USC § 103

Claims 1-95 and 118-144 are rejected under 35 USC § 103(a) as being unpatentable over Miura et al. (U.S. Pat. No. 6,170,996), hereinafter "Miura", in review of Simonis et al. (1 Gb/s VCSEL), hereinafter "Simonis". Without admitting that Miura and/or Simonis are prior art to the present invention and reserving the right to establish that Miura and Simonis are not prior art, Applicants respectively disagree with the Office Action's assertion that Miura, in combination with Simonis, renders the present invention obvious. Claim 1 of the present invention recites in part:

> (e) an adhesive dispensed between the first end of the array of optoelectronic devices and the first end of the array of optical elements, wherein the adhesive contacts the first end of the array of optoelectronic devices and the first end of the array of optical elements.

Figure 3 and the specification of the present invention further illustrate that:

> The first adhesive **116** functions to stabilize and hold the first ferrule **112** to the array of optoelectronic devices **106**

See page 20, lines 7-8 of the present application.

Applicants submit that neither Miura nor Simonis, alone or in combination, disclose, teach or suggest the present invention. Because of the difficulties associated with alignment in the context of arrays (e.g., fiber rotation, misalignment, aberration, scattering and other types of optical cross talk), Applicants respectively assert that the presently claimed invention is not

obvious to skilled persons in the art because (1) there is no motivation to combine Miura and Simonis and (2) even if Miura and Simonis were combined as suggested by the Examiner, the combination would still fail to disclose each and every element recited in the claimed invention.

Miura discloses a single channel optical module having an optical element and a sleeve placed on the substrate. See Abstract of Miura. The front end of 22a of the sleeve 22 is in abutment against the vertical portion 8 of the substrate 6. A ferrule 26 for holding an optical fiber of an optical connector is inserted in the sleeve 22. See Column 5, lines 18-32 of Miura. The Office Action correctly states that Miura does not disclose or show an array of optical elements and an array of optoelectronic devices. See page 2 of the Office Action. The Office Action, however, asserts that it would have been obvious to someone of ordinary skill in the art to combine the disclosure of Miura and the disclosure of Simonis to practice the presently claimed invention. See page 3 of the Office Action. Applicants respectively disagree. Simonis essentially discloses an optoelectronic interconnect configuration (Figure 4 of Simonis) wherein the system consists of an 8 x 8 array of substrate-emitting InGaAs-quantum-well VCSELs as transmitters and an 8 x 8 array of photodetectors as receivers, and a compound lens. See page 3 of Simonis.

Applicants respectfully contend that it would not have been obvious for one skilled in the art to combine Miura and Simonis because the technique of manufacturing a single channel optical module disclosed by Miura does not extend to manufacturing multi-channel optical module, which includes arrays of optoelectronic and/or photodiode devices. Manufacturing single channel optical module can tolerate minor technical issues, such as misalignment. However, these minor technical issues can become major issues in a multi-channel optical

module. For example, a multi-channel optical module is typically more susceptible to misalignment, aberration, scattering, and other types of optical crosstalk. Optical crosstalk generally degrades the system performance and in some cases causes the devise to fail. Moreover, the multi-channel optical module is more sensitive to axial fiber rotation than a single channel optical module because fiber rotation could cause optical misalignment. As such, a technique of manufacturing a multi-channel optical module is typically different and requires additional considerations than a technique of manufacturing a single channel optical module. Thus, Applicants submit that, at the time of invention, it is not obvious to combine Miura and Simonis to practice the present invention.

According to MPEP §2143.01, it specifically instructs "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Neither Miura nor Simonis suggests or indicates that they be combined to make the present invention. A desired outcome provided by the invention cannot be used as the motivation to combine the references if there is no such teaching in the references.

It is well established that a proper §103 combination rejection requires more than just finding in the references the limitations recited in the claim. To reach a proper teaching of method through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. See MPEP 2143 and 2143.01. See also, for example, *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988), *In re Laskowski*, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989). As stated in *In re Fine* at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. See *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

According to the MPEP, the Examiner needs to provide an objective basis for combining the teachings of the applied prior art. MPEP 2143.01 provides instructions as to what must be shown in order to extract specific teachings from various references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or the knowledge generally available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365,1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ 1941 (Fed. Cir. 1992)."

"A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd.Pat.App.&Inter. 1993)."

The instant rejection under §103 fails to show any objective basis for combining the teachings of the references in the manner used by this rejection. If the rejection is maintained, Applicants respectfully request the Examiner to provide the objective basis for combining the teachings of Miura and Simonis. As mentioned earlier, a desired outcome provided by the invention cannot be used as the motivation to combine the references if there is no such teaching

in the references. Since neither Miura nor Simonis teaches or suggests a combination between Miura and Simonis, the Applicants contend that there is no teaching to combine.

At least for the above-stated reasons, Applicants submit that Claim 1 is patentable over Miura in view of Simonis under §103. Since Claims 25 and 50 include similar limitations as Claim 1, Claims 25 and 50 should also be patentable over Miura in view of Simonis. Applicants further believe that Claim 71 is patentable over Miura in view of Simonis. Claim 71 recites in part:

> e) a gap formed between the first end of the array of optoelectronic devices and the first end of the array of optical elements.

In one embodiment, the present invention aligns and connects at least one optical fiber to at least one optoelectronic device while maintaining a gap between at least one optical fiber and at least one optoelectronic device. See page 4 of the present application. Figure 13 and page 36 of the specification of the present application further describe that " [b]y adjusting the z position of the high-precision arm and the high-precision stage, the distance between the bottom edge **1304** of the first ferrule **112** to the top edge **1306** of the optoelectronic devices **106** is adjusted until the objects are within a few microns (e.g., approximately 35 microns apart). Accordingly, a gap exists between the first ferrule **112** and the optoelectronic devices **106**."

In contrast, Miura, as indicated earlier, defines that "the ferrule 26 is inserted in the sleeve 22 so as to abut against the convex portion 18a of the silicone resin 18." See column 5, lines 37-39 of Miura. More specifically, Miura discloses a method of abutting between the silicone resin and the ferrule. Thus, Miura never teaches or suggests a gap existed between a ferrule and an optoelectronic device.

Accordingly, one of ordinary skill in the art would not combine Miura and Simonis, because neither Miura nor Simonis teaches or suggests a combination between Miura and Simonis as discussed earlier. Even if, for the sake of argument, Miura and Simonis were combined, the combination would still fail to disclose or suggest a gap existed between a ferrule and an optoelectronic device. At least for this reason, Applicants submit that Claim 71 is patentable over Miura in view of Simonis under §103.

Applicants believe that Claim 118 is patentable over Miura in view of Simonis. Claim 118 recites in part:

> e) a spacer adapted to the mounting surface, a first end of the spacer proximate to the first end of the array of optical elements.

The present application further discloses that:

> spacer **314** may serve as a mounting surface for the array of optoelectronic devices **106** when they function as receivers . . . The spacer also may function as a mounting surface for other components such as the first ferrule **112** . . . spacer **314** may function to raise the height of the array of optoelectronic devices **106** so as to maximize the optical coupling between the optoelectronic devices **106** and the optical fibers **114**, which are packaged in the first ferrule **112** . . . The spacer may function to adjust the length of the wire bonds or other electrical connection means between the array of optoelectronic devices **106** and other components such as the driver or amplifier chip **108**. The spacer also may be used to aid in creating a gap between the array of optoelectronic devices **106** and the array of optical fibers that are inside the first ferrule **114**. . . According to a preferred embodiment, a small interstitial space or gap is maintained between the second end of the first ferrule **320** and the top surface of the optoelectronic devices **102**.

See pages 15-16 of the present application.

In contrast, Miura defines that "the ferrule 26 is inserted in the sleeve 22 so as to abut against the convex portion 18a of the silicone resin 18." See column 5, lines 37-39 of Miura. More specifically, Miura discloses a method of abutting between the silicone resin and the

ferrule. Miura, however, never teaches or suggests a spacer between a ferrule and an optoelectronic device.

Accordingly, one of ordinary skill in the art would not combine Miura and Simonis, because neither Miura nor Simonis teaches or suggests a combination between Miura and Simonis as discussed earlier. Even if, for the sake of argument, Miura and Simonis were combined, the combination would still fail to disclose or suggest a spacer between a ferrule and an optoelectronic device. At least for this reason, Applicants submit that Claim 118 is patentable over Miura in view of Simonis under §103.

For dependant Claims 2-24, the Office Action further asserts that "it is obvious and well known in the art that UV optical adhesive is a form of epoxy resin." See page 3 of the Office Action. Applicants disagree with this well-known assertion. Applicants believe that a multi-channel optical module having UV optical adhesive and other limitations listed in the independent claim is patentable over Miura in view of Simonis. MPEP §2144.03 instructs that "when a rejection is based on facts within the personal knowledge of the examiner, the data should be stated as specifically as possible, and the facts must be supported, when called for by the applicant, by an affidavit from the examiner." Thus, if this rejection is maintained, Applicants respectfully request the Examiner to provide support that a UV optical adhesive together with the limitations listed in the independent claim were in fact well known in the art at the time of the invention.

The Office Action also asserts that "it is obvious and well known to some one of ordinary skill in the art to use flexible printed circuit boards in optical modules." See page 3 of the Office Action. Applicants disagree. At the time of invention, Applicants believe that it is not well

known to use the flexible printed circuit boards as a portion of the mounting surface plus the limitations listed in the independent claim. Accordingly, if this rejection is maintained, Applicants respectfully request the Examiner to provide support that the mounting surface includes a flexible printed circuit board together with the limitations listed in the independent claim were in fact well known in the art at the time of the invention.

Also, the Office Action correctly states that Miura in view of Simonis does not disclose or show a ferrule having a recess in it. However, the Office Action goes on to say that "it would have been obvious matter of design choice to someone of ordinary skill in the art to combine Miura in view of Simonis with a recess in order to save space." See page 3 of the Office Action. Applicants disagree. Applicants believe that at the time of invention, it is not obvious to have a recess in a ferrule for placing an array of optical fibers closer to an array of optoelectronic devices. Accordingly, if this rejection is maintained, Applicants respectfully request the Examiner to provide support that a ferrule having a recess together with the limitations listed in the independent claim were in fact well known in the art at the time of the invention.

At least for the above-stated reasons, Claims 2-24 are patentable over Miura in view of Simonis. Since the Office Action rejected Claims 26-49, 51-70, 72-95, and 119-144 based on similar grounds as Claims 2-24, Claims 26-49, 51-70, 72-95, and 119-144 are also patentable over Miura in view of Simonis for the similar reasons stated-above.

CONCLUSION

Based on all of the above, Applicants believe all claims now pending in the present application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 23-1703. Applicants thank the Examiner for carefully examining the present application and if a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact Jim Wu at (650) 213-0300.

Respectfully submitted,

Dated: September 12, 2003

By: _____

James M. Wu Reg. No. 45,241
WHITE & CASE LLP
1155 Avenue of the Americas
New York, NY 10036
(650) 213-0302